

# **CONDITIONS OF REGISTRATION FOR M1768 HERBICIDE: 2019 REPORT OF THE 2018 SEASON**

## **DATA REQUIREMENT**

Conditions of Registration for: M1768 Herbicide  
(XtendiMax<sup>®</sup> with VaporGrip<sup>®</sup> Technology; EPA Reg. No. 524-617)

## **AUTHORS**

Chandrashekar Aradhya, Greg Elmore, Mark Groth, Thomas Orr  
Paula Price and Daljit Singh

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## **REGISTRANT**

Monsanto Company  
800 N. Lindbergh Blvd.  
St. Louis, MO 63167

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### CLAIM OF CONFIDENTIALITY

Information claimed as confidential has been removed to a confidential attachment.

Company: Monsanto Company

Company Agent: Thomas Orr

Title: Global Regulatory Affairs Manager

Signature:  Date: January 15, 2019

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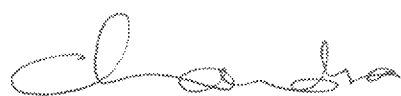
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## STATEMENT OF COMPLIANCE

This report does not meet the U.S. EPA Good Laboratory Practice requirements as specified in 40 CFR Part 160. This report summarizes the monitoring program activities as a condition of registration and therefore was not conducted in compliance with the 40 CFR Part 160.

  
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**Submitter** **Date**  
Thomas Orr, MS  
Monsanto Company  
Global Regulatory Affairs Manager

  
\_\_\_\_\_  
**Sponsor** **Date**  
Tina Bhakta, PhD  
Monsanto Company  
Global Chemistry Expansion Lead

  
\_\_\_\_\_  
**Study Director** **Date**  
Chandrashekar Aradhya, PhD  
Monsanto Company  
Global Regulatory Herbicide Resistance Management Lead

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## **CONDITIONS OF REGISTRATION FOR M1768 HERBICIDE: 2019 REPORT OF THE 2018 SEASON**

As stated in Appendix D, under D. Reporting Component, as a condition of registration of M1768 Herbicide (XtendiMax® with VaporGrip® Technology), Monsanto is required to provide a report to U.S. EPA that includes:

- a. Annual Sales of M1768 herbicide by State.
- b. For this report, current education program and associated materials.
- c. Summary of Monsanto's efforts aimed at achieving implementation of Best Management Practices (BMP's).
- d. Summary of the determinations as to whether any reported lack of herbicide efficacy was "likely resistance", any follow-up actions taken, and, if available, the ultimate outcome (e.g., evaluation of success of additional weed control measures) regarding each case of "likely resistance"; with cases of likely resistance by county and state.
- e. Results of the annual survey including whether growers are implementing herbicide resistance BMPs and a summary of Monsanto's annual review and possible modification based on that survey of the education program and response to likely resistance.
- f. Summary of the status of any laboratory and greenhouse testing performed as a follow up on incidents of likely resistance.

### **a. Annual Sales of M1768 by State**

Information claimed confidential has been removed to the confidential attachment. See Cross Reference 1.

### **b. Current Education Program**

On February 9, 2017 Monsanto submitted a report to U.S. EPA that included the educational plan approach, elements of the plan and example materials (Horak et al. 2017). The submitted plan reflects the education program that has been implemented since 2017. Briefly, as indicated in the submitted plan, education on weed resistance and best management practices (BMPs) has been communicated through the Roundup Ready PLUS® program and website, the herbicide label, and the Technology Use Guide. In addition, weed resistance management educational materials were made available through 3<sup>rd</sup> party organizations and efforts such as the Weed Science Society of America (WSSA), United Soybean Board's "Take Action" initiatives, the Global Herbicide Resistance Action Committee (HRAC) and multimedia campaigns. A robust in-person and online training program was made available in all states where XtendiMax® with VaporGrip® Technology herbicide was registered for use and provided to farmers and / or applicators through the programs currently in place such as the RoundupReady® Xtend Crop System website, Pesticide Applicator Education programs, and trade shows.

### ***Mandatory Dicamba Applicator Training***

Changes in the education program for 2018 compared to the previous year reflected the reclassification of M1768 as a Restricted Use Pesticide for retail sale to and use only by Certified Applicators or persons under their direct supervision<sup>1</sup> and only for those uses covered by the Certified Applicator's certification, including the requirement to complete mandatory dicamba or auxin-specific training and record keeping prior to applying this product. Monsanto launched a mandatory dicamba training campaign in 2018 alone or in partnership with 23 states (Arizona, Colorado, Delaware, Illinois, Iowa, Kansas, Louisiana, Maryland, Michigan, Minnesota, Nebraska, New Mexico, New Jersey, New York, North Dakota, Ohio, Pennsylvania, South Carolina, South Dakota, Texas, Virginia, West Virginia and Wisconsin) where training was mandatory, and registrants were allowed by the state to conduct the training. Monsanto also provided training materials and trainers to assist with state-held training events in several states. The training campaign included both in-person, class-room type setting and a web-based self-training option where states allowed online training. The online training modules were made available in both English and Spanish. Approximately 96,000 applicators were trained through combined effort from the industry and the state extension trainings, with Monsanto alone training >26,000 applicators. Monsanto held at least one public event in every state where XtendiMax<sup>®</sup> with VaporGrip<sup>®</sup> Technology herbicide was registered and had the state approval to train. We worked in close collaboration with each of the states to train on the EPA label application requirements as well as on any local restrictions or requirements imposed by each state.

### **c. Implementation of Best Management Practices (BMP's)**

Best management practices, education and expert recommendations for weed resistance management in the Roundup Ready<sup>®</sup> Xtend Crop System were actively communicated to growers through multiple venues including RoundupReadyXtend.com and RoundupReadyPLUS.com. Weed scientists and agronomists were filmed to provide educational videos on topics including drift vs. volatility, key learnings from past growing seasons, what to expect in dicamba application training and the importance of the dicamba training program. These sites provide expert weed scientist recommendations for proven weed management solutions by crop and region, incentives for using endorsed herbicides with multiple, effective sites of action, and up-to-date information on important agronomic topics. Monsanto also actively promoted external herbicide resistance management resources and education, including Take Action (iwilltakeaction.com), in training and educational materials. Mandatory dicamba training materials presented in the in-person training sessions were posted on RoundupReadyXtend.com. Communications campaigns were implemented to raise awareness of the need for mandatory dicamba or auxin-specific training via direct mail and email, reaching >100,000 growers. Monsanto developed and deployed the RRXTEND Spray App, a digital tool that provides location-specific weather forecasts, digital record-keeping capabilities and education resources related to the Roundup Ready<sup>®</sup> Xtend Crop System to growers and applicators. In addition, educational videos and state-specific restrictions or additional requirements related to the state

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<sup>1</sup> New guidelines per EPA Registration # 524-617 dated November 1, 2018 will be followed in 2019 season

registrations of XtendiMax<sup>®</sup> with VaporGrip<sup>®</sup> Technology were communicated through RoundupReadyXtend.com. Annual grower and custom applicator training materials incorporated BMP's as well as the recommendation that growers scout their fields after application to detect weed escapes or shifts in weed species and report any incidence of non-performance of M1768 against a particular weed species through their Monsanto retailer or representative, or by calling 1-844-RRXTEND. If lack of weed control efficacy was reported, the grower was instructed to treat weed escapes with an effective herbicide or combination of herbicides and/or use non-chemical methods to remove escapes, as practical, with the goal of preventing further seed production.

**d. Lack of Herbicide Efficacy and “Likely Resistance”**

Following the process that was established to investigate and follow up on M1768 efficacy, growers from a total of 12 counties in seven states reported a lack of M1768 efficacy to either waterhemp (*Amaranthus tuberculatus*), Palmer amaranth (*Amaranthus palmeri*), kochia (*Kochia scoparia*) and / or velvetleaf (*Abutilon theophrasti*). From the resulting investigations, a total of 19 populations of weed seeds were collected from growers' fields based on the criteria in Norsworthy et al. (2012). In addition to making the weed sample collection, weed control recommendations were made and implemented for each of the fields. See Table 1 for the county and state where these reports originated and the species of weed seed collected. The collected weed seeds were tested in a controlled environment and available test results are provided in section (f).

**e. Annual Survey Results**

Monsanto conducted a phone survey of a representative subset of the growers who planted 50+ acres of Roundup Ready 2 Xtend<sup>®</sup> soybeans and or XtendFlex<sup>®</sup> cotton in 2018 and who had applied XtendiMax<sup>®</sup> with VaporGrip<sup>®</sup> Technology over-the-top to at least some of their acres.

Of the 358 that responded, approximately 71% of growers were self-applying XtendiMax<sup>®</sup> with VaporGrip<sup>®</sup> Technology; ~64% applied at the labeled rate for maximum weed control (22 fl oz/acre) and 66% were mixing herbicides with unique sites of action. Growers reported scouting for weed pressure before applications and monitoring weed control and escapes after applications in >78% of the cases for both soybean and cotton. Ninety- three percent of soybean growers and 94% of cotton growers reported that they were satisfied with the weed control provided by XtendiMax<sup>®</sup> with VaporGrip<sup>®</sup> Technology.

In addition to the U.S. EPA label for XtendiMax<sup>®</sup> with VaporGrip<sup>®</sup> Technology, growers reported that they obtained additional XtendiMax<sup>®</sup> with VaporGrip<sup>®</sup> Technology information from their agronomists, dealer/retailer, University/Extension representatives, [www.roundupreadyxtend.com](http://www.roundupreadyxtend.com) and Monsanto representatives.

**f. Testing of Incidents of “Likely Resistance”**

As mentioned above in section (d), growers from 12 counties in seven states reported a lack of M1768 efficacy in weed control. Weed seed samples collected from these fields were tested in a greenhouse at Monsanto’s research facility at Chesterfield, MO. Weeds were sprayed with M1768 herbicide at the label rate of 560g ae/ha and twice the label rate of 1120g ae/ha. Available greenhouse testing results for 18 of the 19 populations are provided in Table 1. Testing of the remaining population is on-going and results will be provided as information becomes available. Fourteen weed populations, including waterhemp, Palmer amaranth, kochia and velvetleaf weed species, showed all plants either dead or severely stunted at both the 560g ae/ha and 1120g ae/ha rates. Four waterhemp populations (11492900, 11492901, 11492902 and 11492907) had one or two surviving plants out of the total plants tested at 560g ae/ha rate (1/22, 1/19, 2/26 and 1/30 plants, respectively) and no survivors at the 1120g ae/ha rate. This small amount of observed variability within and across the field collected weed populations at the 560g ae/ha rate of dicamba is within the reported range of natural variability in waterhemp populations (Crespo et al 2016). Nevertheless, these fields will be monitored for waterhemp control by dicamba in 2019.

**REFERENCES**

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- Horak, M., Burchette, S., Starke, M., Elmore, G., 2017. M1768 Herbicide. Herbicide Resistance Management Plan Educational/Informational Component. Educational Plan Submission. 20170209 (Monsanto tracking ID CDX\_2017\_000889).
- Norsworthy, J.K., Ward, S.M., Shaw, D.R., Llewellyn, R.S., Nichols, R.L., Webster, T.M., Bradley, K.W., Frisvold, G., Powles, S.B., Burgos, N.R., Witt, W.W., Barrett, M., 2012. Reducing the Risks of Herbicide Resistance: Best Management Practices and Recommendations. *Weed Science* 2012 Special Issue:31-62.



**Table 1. Greenhouse Testing Summary of Cases of Likely Resistance in 2018**

<b>Sample ID</b>	<b>State</b>	<b>County</b>	<b>Weed species tested<sup>1</sup></b>	<b>Likely resistance based on greenhouse test (Yes/No)</b>
11493164	NE	Hamilton	Palmer amaranth	No
11492903	NE	Hamilton	Palmer amaranth	No
11492904	NE	Buffalo	Palmer amaranth	No
11492905	KS	Thomas	Palmer amaranth	No
11492835	KS	Sterling	Palmer amaranth	No
11492733	TX	Knox	Palmer amaranth	No
11492894	IL	Iroquois	Waterhemp	No
11492891	IL	Clark	Waterhemp	No
11492892	IL	Fulton	Waterhemp	No
11492897	IA	Hamilton	Waterhemp	No
11492898	IA	Hamilton	Waterhemp	No
11492899	IA	Osceola	Waterhemp	No
11492900	MN	Douglas	Waterhemp	No
11492901	MN	Douglas	Waterhemp	No
11492902	MN	Douglas	Waterhemp	No
11492907	SD	Aurora	Waterhemp	No
11492909	SD	Aurora	Waterhemp	No
11492910	SD	Aurora	Velvetleaf	No
11492908	SD	Aurora	Kochia	Data being generated

<sup>1</sup> Seeds collected from surviving weeds in the field

**CONFIDENTIAL ATTACHMENT – FIFRA10(D)(1)(a)**

Cross Reference 1, page 5

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# **Ex. 4 CBI**